

# **NHEXAS Analysis Workshop Overview**

# **NHEXAS ANALYSIS WORKSHOP: INTRODUCTION**

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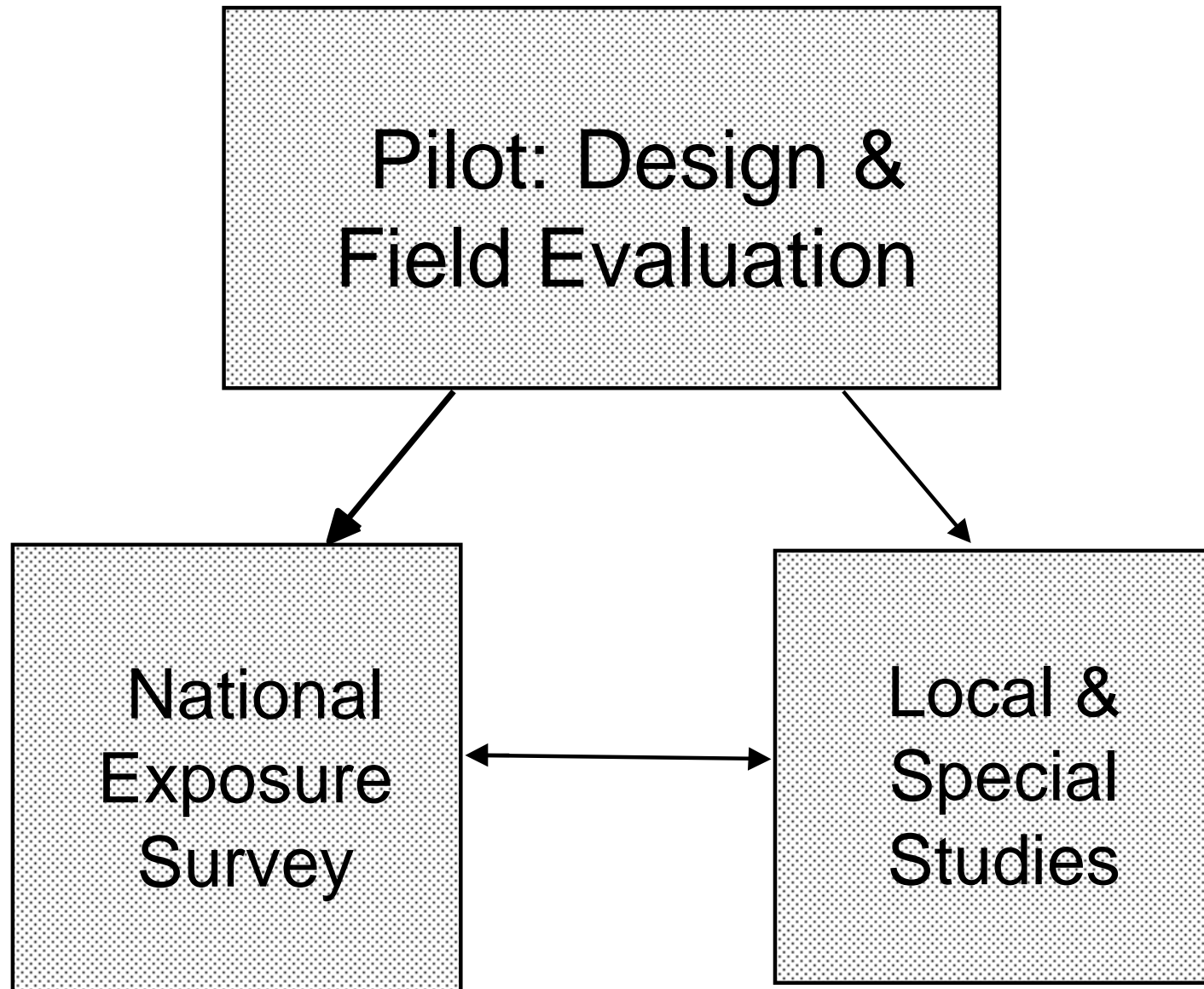
**ASSOCIATE DIRECTOR FOR HEALTH NATIONAL  
EXPOSURE RESEARCH LABORATORY  
EPA**

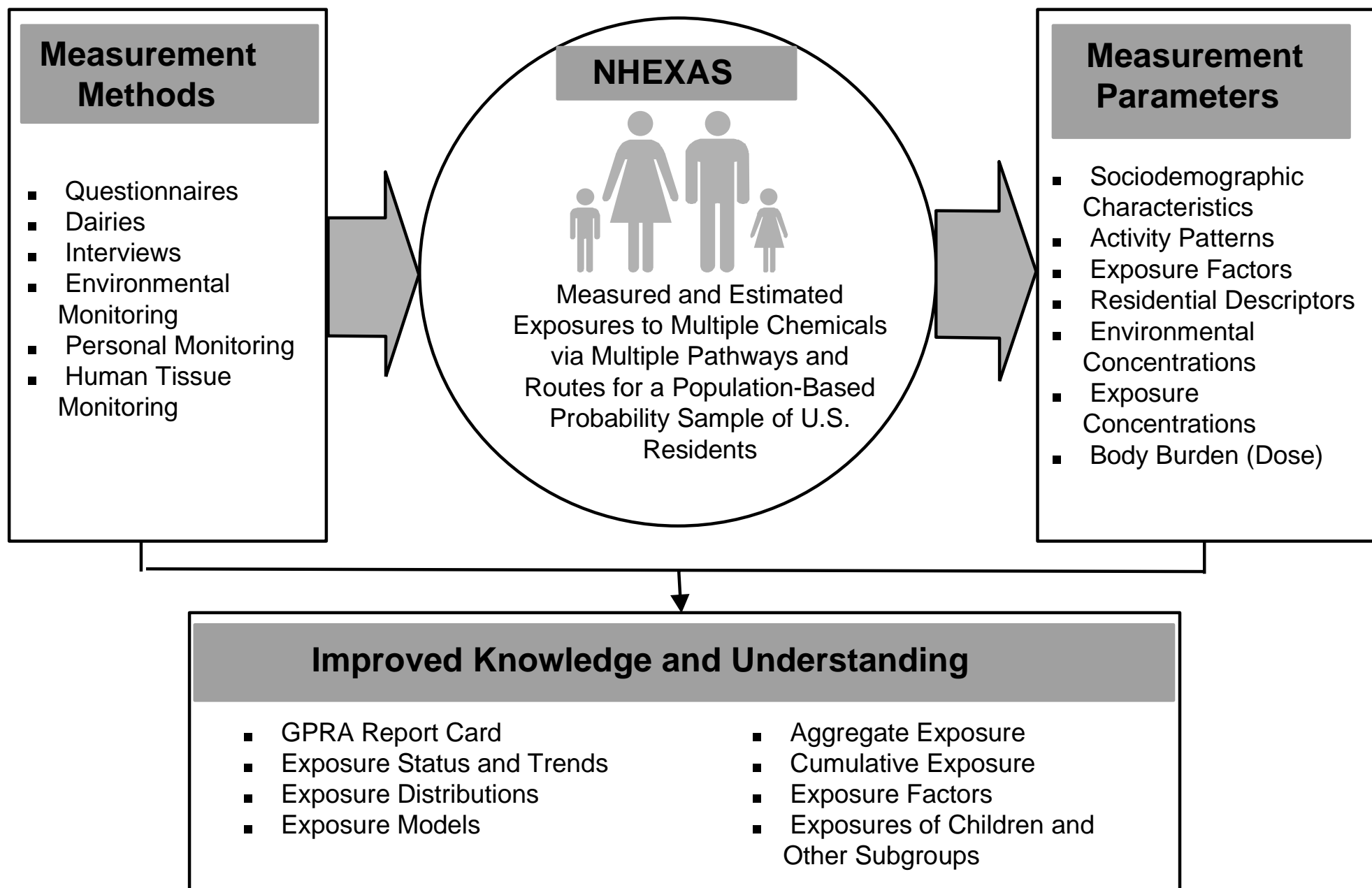
# **PRESENTATION STRUCTURE**

- **Introduction to NHEXAS**
- **The Science Advisory Board Review**
- **Workshop Role in Development of an  
NHEXAS Analysis Strategy**

# **INTRODUCTION TO NHEXAS**

# LONG-TERM STRUCTURE OF NHEXAS





# **GOAL AND OBJECTIVES**

- **Goal: To provide critical information about multipathway, multimedia population exposure distributions to chemical classes**
- **Objectives**
  - **Evaluate the feasibility of NHEXAS concepts, methods, and approaches for the conduct of future population-based exposure studies**
  - **Evaluate the utility of NHEXAS data for improved risk assessment and management decisions**
  - **Test the hypothesis that the distributions of exposure given by modeling and extant data do not differ from the measurement-based distributions of exposure**

# **OBJECTIVES, CON'T**

- **Define the distribution of total human exposures for a relatively large geographic area**
  - **Identify the upper 90th percentile of the distribution**
  - **Provide baseline for later comparisons**
  - **Evaluate pathways**
  - **Identify predictors of exposure**
  - **Make comparisons with biomarkers**
- **Stimulate exposure research and forge strong working relationships between government and non-government scientists**



# **NHEXAS PROGRAM MATRIX**

## **■ Research Consortia**

- RTI/EOHSH; Region V field study**
- UA/Battelle/IITRI; Arizona field study**
- Harvard/Hopins/Emory/Weststat/SWRI;  
Baltimore time-series study**

## **■ Federal Agencies**

- EPA/ORD; all aspects**
- CDC; biomarkers**
- FDA; food analyses**
- NIST; QA**

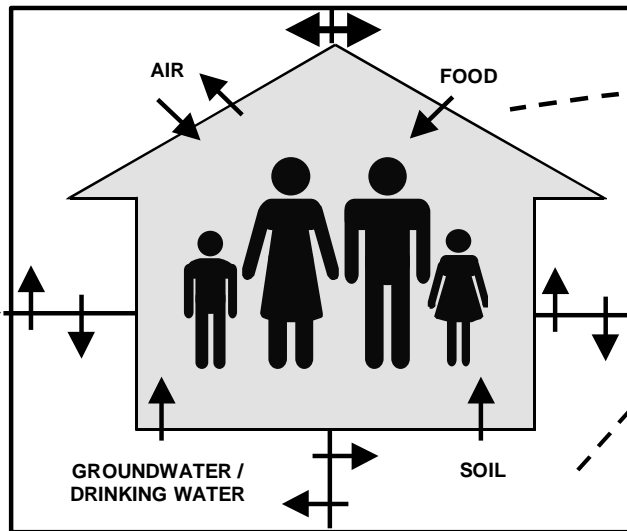
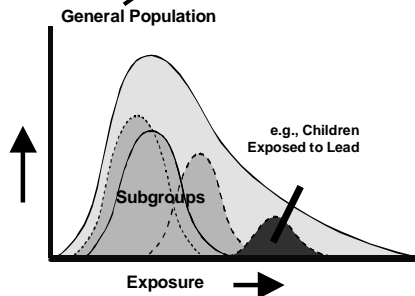
# Probabilistic Framework of NHEXAS

National - Regional - Community Scales

Multimedia, Multipathway  
Exposure Model

Probability-Based  
Population Sample

Number of People



Actual Measures of Cumulative and Multipathway Exposure

# **SELECTION OF TARGET ANALYTES**

- **Known or suspected to be major environmental health risks**
- **Occur in more than one environmental media**
- **Importance to several EPA program offices or regions**
- **Importance to other federal agencies**
- **Ability to collect and analyze samples**
  - **Multimedia (environ., exposure, biological)**
  - **At concentrations of concern or occurrence in target population (median)**

# PRIMARY MULTIMEDIA ANALYTES

- **Metals:** *As, Pb, Cr, Cd, Ni*
- **Pesticides:** *chlorpyrifos, diazinon, malathion, atrazine*
- **VOC's:** *benzene, chloroform, trichloroethylene, tetrachloroethylene, perchloroethylene, trichloroethane, styrene, toluene, xylenes, p-dichlorobenzene (not in Baltimore study)*
- **PAH's:** *B(a)P, anthracene, phenanthrene, chrysene, B(a)anthracene, acenaphthylene, B(g,h,i)perylene, fluoranthene, pyrene, indeno(1,2,3-cd)pyrene*

**Italics - common analytes**

# **ACTUAL HUMAN EXPOSURE MEASUREMENTS: SAMPLE MEDIA AND TYPES**

- **Air**
  - **Residential (indoor, outdoor)**
  - **Personal**
- **Water (Residential)**
  - **Tap (standing, flush)**
  - **Drinking**
- **Food and Beverage**
  - **Liquids**
  - **Solids**

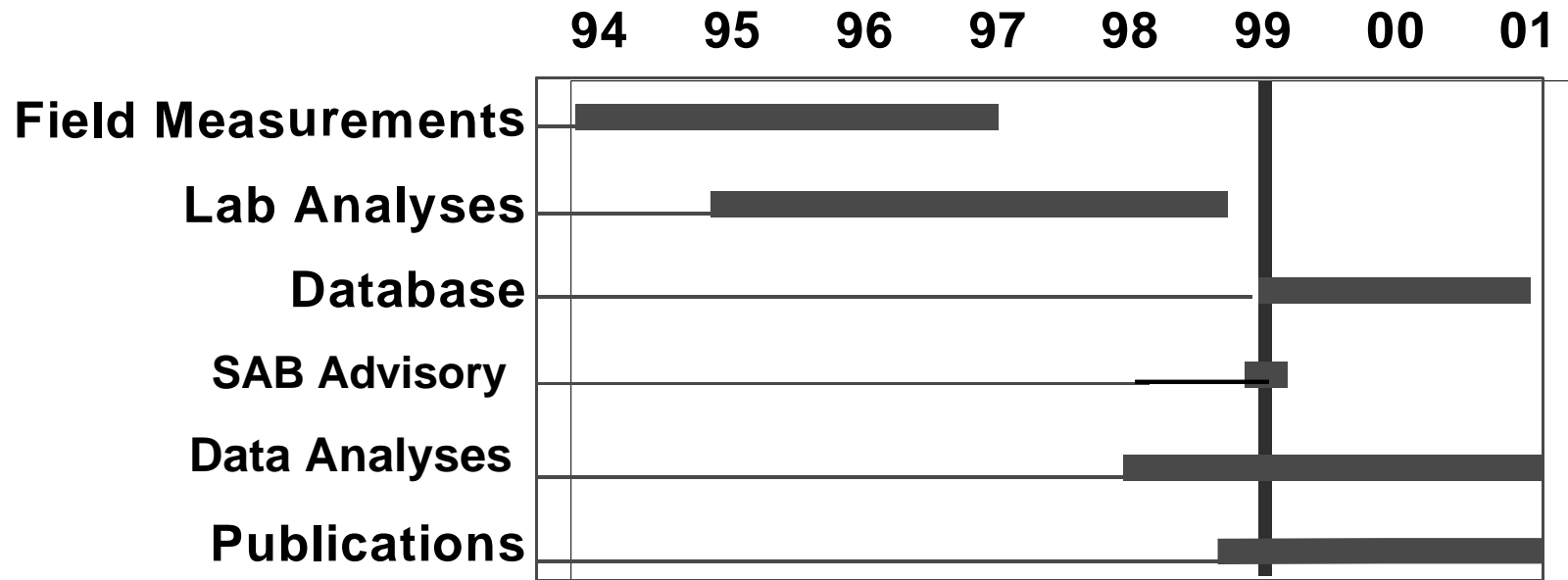
# **ACTUAL HUMAN EXPOSURE MEASUREMENTS: SAMPLE MEDIA AND TYPES, CON'T**

- **Soil (residential)**
- **Surfaces (residential)**
  - **Dust wipe/press; vacuum; deposition plate/mat**
- **Dermal (personal)**
  - **Rinse, wipe**
- **Biomarkers**
  - **Urine**
  - **Blood**

# DATABASES

- **Goal: Provide accessible, long-term, quality assured record of data and metadata for future analyses and modeling**

# Where Are We Now?





# **THE SAB REVIEW**

# **RECOMMENDATIONS FROM THE SAB REPORT**

- **NHEXAS pilots are scientifically "outstanding in both design and implementation ... ."**
- **The NHEXAS design "can help to identify serious human health risks, to decide what interventions would be helpful in reducing these risks, and to document the effectiveness of interventions in actually reducing exposures."**

# **RECOMMENDATIONS FROM THE SAB REPORT, CON'T**

- **The "NHEXAS pilot study is highly relevant to the Government Performance and Results Act (GPRA) and SAB's 'Integrated Environmental Decision-making Framework' which emphasize performance evaluation as a key to effective environmental health protection."**
- **ORD should develop a feasibility study for a national-scale human exposure survey.**

# RECOMMENDATIONS FROM THE SAB REPORT, CON'T

- ORD should publicize significance of NHEXAS framework and continue to build partnerships.
- *ORD should provide additional resources to strengthen analysis of NHEXAS pilot data or the "expenditures incurred during the last five years would be of limited utility."*
- *ORD should develop a strategy for the analyses of the NHEXAS data, and the SAB should review it.*

# **WORKSHOP ROLE IN DEVELOPMENT OF AN NHEXAS DATA ANALYSIS STRATEGY**

# **APPROACH TO DEVELOPING AND IMPLEMENTING STRATEGY**

- **Convene workshop to obtain broadest input possible in defining potential analysis projects, with priority rankings**
- **Use workshop proceedings as input to ORD development of draft analysis strategy, with priorities**
  - **Expect some differences to reflect major EPA interests**
- **SAB review of draft strategy**

# **APPROACH TO DEVELOPING AND IMPLEMENTING STRATEGY, CON'T**

- **ORD development of the final strategy**
- **ORD implementation of strategy, consistent with resources available and appropriate mechanisms of funding. Range includes in-house, contracts, cooperative agreements, and grants**
- **We have developed project descriptor formats that are informative enough for strategic planning, without being so detailed as to contain intellectual property or to provoke the need for recusals**